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THE VOYAGE OF THE *PLANET*.

The *Planet,* a steamer of 650 tons displacement, speed 9.5 geographical miles an hour, was built in 1905 by the German Government for oceanic researches and coast surveys. She sailed from Germany in January, 1906, for the German possessions in the Pacific, where she will be engaged for several years in survey and other work. Splendidly equipped in all respects, her voyage to the Bismarck Archipelago by way of Lisbon, Cape Verde Islands, St. Helena, Cape Town, Madagascar, Mauritius, Colombo, Macassar, and Amboina was made the occasion of a variety of scientific observations which have been reported in detail in the *Annalen der Hydrographie.* A summary of the work in all departments has also been contributed to *Globus* (1906, p. 102 and 1907, p. 178) by Dr. Krämer, a member of the scientific staff.

The soundings throughout the voyage will make important corrections and additions to the charts. South of Cape Verde a depth of 2,805 fathoms was found where a bank with only 1,160 fathoms was supposed to exist. The contour of the ocean floor from deep-sea depths to Sierra Leone was determined. From Cape Town the route was deflected for some distance due south, with the result that the shoal reported by the *Cyclops* about the middle of the last century in 36° 40′ S., 41° 20′ E., could not be found, as depths reaching 2,952 fathoms occur at this place. Banks were discovered on the further voyage, one of them with only 750 fathoms being in 33° S., 36° E., and another with depths varying from 820 to 1,360 fathoms stretching south of Madagascar to 32° S. A line of soundings east from Madagascar shows a steep but regular slope. The *Planet* was unable to find the submarine reef reported by the *Valdivia* in 20° 10′ S., 68° E.

As the *Planet* approached the Malay Archipelago an important series of soundings was carried out to the west of the Sunda Islands, with results which will enable us to represent in future charts the sub-oceanic relief in this region with far greater accuracy than has hitherto been possible. The most important fact adduced was that a deep trough runs parallel with the south coast of Java and possibly also extends parallel with the Sumatra coast. This trough contains the deepest sounding yet obtained in the whole Indian Ocean (3,828 fathoms).

Prof. Supan prints a chart (*Petermanns Mitteilungen,* No.

3, 1907) which is based on this information obtained from the *Planet*. He calls attention to the fact that, several years ago, he suspected the existence of this trough and on the strength of two soundings indicated it in his bathymetric chart, which appeared in the *Mitteilungen* in 1899. The soundings of the *Planet* also demonstrated the double character of this line of depression, inasmuch as a second and shallower trough occurs nearer to the Java coast, a submarine ridge separating the two depressions. This ridge seems to be a southeasterly prolongation of that on which the Mentawy group off the coast of Sumatra stands; it is also separated from the larger land-mass to the east by a well-defined trough. Prof. Supan believes that this points to folding as a mode of origin of such troughs, another instance of which has recently been brought to light along the line of the Liukiu Islands.

Studies of coral formations were made in the Indian Ocean near Rodriguez and at Suadiva in the Maldives, and Dr. Krämer says in *Globus* that he found support there for the ideas of Voeltzkow concerning the part played by sedimentation in building up the reefs. He was also impressed with the luxuriance of the vegetation at Suadiva.

Soundings off the north coast of New Guinea showed that the sea-bottom falls to ocean depth even more steeply than on the east coast of Madagascar. At one place, only 9 sea miles from the land, a depth of 1854 fathoms was obtained. The Matty, Echiquier, Hermit, and Admiralty groups were found to rise from a plateau with depths of 500 to 800 fathoms, and the drop from these islands to the depths has at first an angle of about 45°.

Complete series of temperatures of sea water with samples from different depths were taken throughout the long voyage. The upper atmosphere was also assiduously explored by means of kites and balloons. In summarizing this feature of the work, the *Geographical Journal* (May, 1907) says that the balloon and kite ascents between Macassar, Celebes, and Matupi in the Bismarck Archipelago, at the time of the northeast monsoon, showed that the lower air current reaches an altitude of only about 1,300 to 1,600 feet, above which was a layer of still air of varying thickness, while above this an almost due east wind prevailed up to the greatest heights obtained, estimated at about 33,000 feet. In the Indian Ocean, the kites reached a height of about 16,000 feet, though, in the Atlantic, the limit, as a rule, was 6,500 feet. The results of these observations will afford interesting comparisons with those of Rotch, Hergesell, and others in the Atlantic.